Programme on

"Numerical Analysis of Complex PDE Models in the Sciences"

June 11 – August 17, 2018

organized by

Annalisa Buffa (EPFL Lausanne), Thomas Y. Hou (Caltech), J. Markus Melenk (TU Vienna), Ilaria Perugia (U Vienna), Christoph Schwab (ETH Zurich)

Workshop 3 on "Interplay of geometric processing, modelling, and adaptivity in Galerkin methods" organized by Annalisa Buffa (EPFL Lausanne) and Ilaria Perugia (U Vienna)

July 16 – 20, 2018

- **Monday, July 16, 2018**

  09:00 – 09:30 **Registration**

  09:30 – 10:15 **Giancarlo Sangalli (University of Pavia)**
  Computational efficiency in isogeometric analysis

  10:15 – 10:45 *Coffee / Tea Break*

  10:45 – 11:30 **Bert Juettler (Johannes Kepler University Linz and RICAM Linz)**
  Accurate Numerical Quadrature on Trimmed Elements in Isogeometric Analysis

  11:30 – 12:15 **Ulrich Langer (Johannes Kepler University Linz and RICAM Linz)**
  Adaptive Space-Time Isogeometric Analysis

  12:15 – 14:00 *Lunch Break*

  14:00 – 14:45 **Jay Gopalakrishnan (Portland State University)**
  Discretization errors in the FEAST algorithm for eigenvalues

  14:45 – 15:15 *Coffee / Tea Break*

  15:15 – 16:00 **Michael Neilan (University of Pittsburgh)**
  Exact smoothed piecewise polynomial sequences on Alfeld splits

  16:00 – 16:45 **Olaf Steinbach (TU Graz)**
  Coercive space-time finite element methods

- **Tuesday, July 17, 2018**

  09:00 – 9:45 **Lourenço Beirão da Veiga (University of Milano-Bicocca)**
  The Stokes complex for Virtual Elements

  9:45 – 10:15 *Coffee / Tea Break*

  10:15 – 11:00 **Silvia Bertoluzza (IMATI-CNR Pavia)**
  Stabilizing DG methods on polygonal meshes via computable dual norms

  11:00 – 11:45 **Franco Brezzi (IMATI-CNR Pavia)**
  Virtual Element approximation of Magnetostatic problems via Vector Potential Formulation

11:45 – 14:00 *Lunch Break*

14:00 – 14:45 **Andrea Bressan (University of Oslo)**
Best approximation space on uniform partitions

14:45 – 15:15 *Coffee / Tea Break*

15:15 – 16:00 **John Evans (University of Colorado Boulder)**
Mesh Generation, Parameterization, and Optimization for High-Order Finite Element and Isogeometric Analysis

16:00 – 16:45 **Carlotta Giannelli (University of Florence)**
Refinement and coarsening strategies for adaptive methods with hierarchical splines

- **Wednesday, July 18, 2018**

  09:00 – 9:45 **Donatella Marini (University of Pavia, and IMATI-CNR Pavia)**
  Lowest order Virtual Element approximation of magnetostatic problems

  9:45 – 10:15 *Coffee / Tea Break*

  10:15 – 11:00 **Alexandre Ern (University Paris-Est and INRIA)**
  Edge finite element approximation of Maxwell's equations in heterogeneous domains

  11:00 – 11:45 **Iain Smears (University College London)**
  Time-parallel iterative solvers for parabolic evolution equations: an inf-sup theoretic approach

  11:45 – 14:00 *Lunch Break*

  14:00 – 14:45 **Erik Burman (University College London)**
  Integrating geometric data in the computational solution of PDE using cutFEM

  14:45 – 15:15 *Coffee / Tea Break*

  15:15 – 16:00 **Pedro Morin (Universidad Nacional del Litoral, Argentina)**
  A new perspective on adaptive hierarchical B-splines

  16:00 – 16:45 **Rob Stevenson (University of Amsterdam)**
  Optimal preconditioners of linear complexity for problems of negative order discretized on locally refined meshes

- **Thursday, July 19, 2018**

  09:00 – 9:45 **Sören Bartels (University of Freiburg)**
  Approximating gradient flow evolutions of self-avoiding inextensible curves and elastic knots

  9:45 – 10:30 **Ralf Hiptmair (ETH Zürich)**
  Approximating Shape Gradients

  10:30 – 11:00 *Coffee / Tea Break*

  11:00 – 11:45 **Bernardo Cockburn (University of Minnesota)**
  An introduction to the theory of M-decompositions

  11:45-12:30 **Dirk Praetorius (TU Wien)**
  Axioms of adaptivity revisited: Optimal adaptive IGAFEM

  12:30 – 14:00 *Lunch Break*

  14:00 – 14:45 **Fehmi Cirak (University of Cambridge)**
  Isogeometric analysis with manifold-based basis functions

  14:45 – 15:15 *Coffee / Tea Break*

15:15 – 16:00 **Thomas Takacs (Johannes Kepler University Linz)**
C^1-smooth isogeometric spaces on multi-patch domains

16:00 – 16:45 **Rafael Vázquez (EPFL Lausanne)**
Dual complex for structure preserving isogeometric methods

- **Friday, July 20, 2018**

  09:00 – 9:45 **Andreas Schröder (University of Salzburg)**
  Error estimates for primal-hybrid and dual-mixed hp-finite element methods

  9:45 – 10:30 **Daniele Boffi (University of Pavia)**
  Adaptive finite element method for the Maxwell eigenvalue problem

  10:30 – 11:00 *Coffee / Tea Break*

  11:00 – 11:45 **Peter Binev (University of South Carolina)**
  Near-Best Adaptive Approximation on Conforming Partitions

  11:45 – 12:30 **Ricardo Nochetto (University of Maryland)**
  Structure preserving FEM for the Q-model of uniaxial nematic liquid crystals

All talks take place at ESI, Boltzmann Lecture Hall!